

## CLAIMS

### What is claimed is:

1. A micro fluidic module for guiding a working fluid supplied by a fluid reservoir, comprising:

5        a micro fluid channel barrier, composed of: a firing chamber formed in said micro fluid channel barrier for storing working fluid to be ejected; a fluid inlet channel connecting exterior of said micro fluid channel barrier to interior of said firing chamber and having a wider section at exterior side of said barrier and a narrower section at interior of said firing chamber; a fluid outlet channel connecting said interior of said firing chamber to exterior of  
10        said micro fluid channel barrier and having a wider section at interior of said firing chamber and a narrower section at exterior side of said barrier; and

         an actuator, mounted in interior of said firing chamber, for providing pressure to said working fluid;

         therefore, a part of said working fluid pressurized by said actuator is expelled through  
15        said outlet channel from said firing chamber to exterior of said channel barrier; and other working fluid supplied by said fluid reservoir is refilled through said inlet channel from exterior of said channel barrier to said firing chamber.

2. A micro fluidic module according to claim 1 wherein said actuator is a heater, supplied by exterior electrical power, for providing thermal energy to said working fluid in  
20        said firing chamber and causing said ejection.

3. A micro fluidic module according to claim 1 wherein said actuator is made of piezoelectric material.

4. A micro fluidic module according to claim 1 wherein said micro fluid channel barrier is a polygonal body.

5. A micro fluidic module according to claim 1 wherein said firing chamber is a polygonal cavity.

6. A micro fluidic module according to claim 1 wherein said micro fluid channel barrier comprises multiple fluid inlet channels for increasing refilling speed of working fluid from exterior of said channel barrier to said firing chamber.

7. A micro fluidic module according to claim 1 wherein said micro fluid channel barrier comprises multiple fluid outlet channels for increasing expelling speed of working fluid from said firing chamber to exterior of said channel barrier.

8. A micro fluidic module according to claim 1 wherein said micro fluid channel barrier comprises a plurality of fluid firing chambers each having at least an inlet channel and at least an outlet channel connecting between said firing chambers and exterior opposite sides of said micro fluid channel barrier.

9. A micro fluidic module according to claim 8 wherein said inlet channel and said outlet channel of each firing chamber have convergent sections to get a one-way consistent fluid flow passing through said firing chamber; said fluid flow for adjacent firing chambers are opposite to each other so as to form an S-shape fluid flow.

10. A micro fluidic module for guiding a working fluid supplied by a fluid reservoir, comprising:

a plurality of micro fluid channel barrier, each composed of: a firing chamber formed in said micro fluid channel barrier for storing working fluid to be ejected; at least a fluid inlet channel connecting exterior of said micro fluid channel barrier to interior of said firing chamber and having a wider section at exterior side of said barrier and a narrower section at interior of said firing chamber; at least a fluid outlet channel connecting said interior of said firing chamber to exterior of said micro fluid channel barrier and having a wider section at interior of said firing chamber and a narrower section at exterior side of said barrier; and

a plurality of actuators, each mounted in interior of said firing chamber, for providing

pressure to said working fluid;

therefore, parts of said working fluid pressurized by said actuators are expelled through said outlet channels from said firing chambers to exterior of said channel barriers; and other working fluid supplied by said fluid reservoir is refilled through said inlet  
5 channels from exterior of said channel barriers to said firing chambers.

11. A micro fluidic module according to claim 10 wherein said actuators are heaters, supplied by exterior electrical power, for providing thermal energy to said working fluid in said firing chambers and causing said ejection.

12. A micro fluidic module according to claim 10 wherein said actuators are made of  
10 piezoelectric material.

13. A micro fluidic module according to claim 10 wherein a fluidic outlet channel of a fluidic channel barrier corresponds to a fluid inlet channel of an adjacent fluidic channel barrier.

14. A micro fluidic module according to claim 10 wherein a fluidic inlet channel of a  
15 fluidic channel barrier corresponds to a fluid outlet channel of an adjacent fluidic channel barrier.

15. A micro fluidic module according to claim 10 wherein one side of said fluidic channel barrier is formed with said inlet channel and said outlet channel.

16. A micro fluidic module according to claim 10 wherein said micro fluid channel  
20 barriers are arranged in a matrix.

17. A micro fluidic module according to claim 10 wherein said micro fluid channel barriers are polygonal bodies.

18. A micro fluidic module according to claim 10 wherein said micro fluid channel barriers are arranged in a faveolate construction.

19. A micro fluidic module according to claim 10 wherein said firing chambers are polygonal cavities.